must of necessity be used early in the development of the tumor or malignant growth. Hence an early diagnosis is imperative. For that reason I present this test, with some of the evidence, trusting it may be of service. It is easily applied and based upon a sound foundation, viz., the passing into the circulation and elimination with the urine (a natural excretion) of the products of hemolysis, cytolysis, and proteolysis by the cancer cell during its growth and extension.

In cancer the amount of the hema-uro-chrome must of necessity vary with the activity and extent of the cancer process, and I do not believe a percentage proportion would be of value if determined. I have therefore depended upon the relative amount of the hema-uro-chrome obtained from a definite quantity of urine by a certain amount of hydrochloric acid and ether.

I hope that which I have presented will aid in the diagnosis of cancer at a period when removal by operation or some form of medication may rid the individual of a terrible menace.

Beside, a negative finding will enable us to relieve that mental distress associated with a suspicion of cancer or of its recurrence.

A PSYCHOSIS FOLLOWING CARBON-MONOXIDE POISONING, WITH COMPLETE RECOVERY.[1]

By Mary O'Malley, M.D.,

SENIOR ASSISTANT PHYSICIAN, GOVERNMENT HOSPITAL FOR THE INSANE, WASHINGTON, D. C.

Among the various toxic psychoses which have come under my observation in the Government Hospital for the Insane, one which was produced by carbon-monoxide poisoning is of special interest, in view of the fact that the patient suffered from a severe intoxication which resulted in the development of mental symptoms one month following the accident, and terminated in a complete recovery. That psychic disorder is one of the sequels of this form of poisoning has long been recognized, yet few cases have been recorded in this country. A careful review of the literature yields scanty information as to the clinical and pathological course of this toxemia, notwithstanding many accidents occur in our large cities and collieries. However, some valuable observations on this subject can be obtained from foreign publications.

Cases of carbon-monoxide poisoning may be accidental, suicidal, or homicidal, or the latter two may be combined. In France four-fifths of the suicides are caused by poisoning with carbon-monoxide gas. In the large cities of this country scarcely a day passes without a number of cases are recorded of accidental or suicidal intoxication from this gas. According to the daily papers in New York City alone there were reported to the coroner in the first six weeks of the present year seventy-five fatalities. Deaths by gas poisoning have been steadily increasing for the past twenty-five years, and this increase has been due to the manufacture of illuminating gas by a method known as "water gas." This gas has come to be such a serious cause of death, that a point has been reached where it behooves the health authorities and others interested in the subject to consider what steps can be taken to curtail this mortality. However, at present there are no available statistics of these accidents or fatalities. The last "Bulletin of the United States Census Bureau on Mortality Statistics" does not group these deaths independently, but includes them under the general head of Mortality from Intoxication. In 1910 the Bureau of Commerce and Labor issued a Bulletin on "Fatal Accidents in Coal Mines." This report furnishes no information concerning the effects of such intoxication upon those who escaped death.

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[1] Read at the International Congress on Hygiene and Demography, 1912.

In recent years many of the States have appointed commissions to investigate occupational diseases, and in 1909 these commissions united as a permanent organization known as the National Conference upon Compensation for Industrial Accidents, with the object in view to obtain uniform legislation for men engaged in dangerous occupations. In connection with this the International Association for Labor Legislation has prepared a plan for the protection of workmen exposed to the dangers of industrial poisons in order that they may be able to get adequate legislation regulating the same. A committee of this society has compiled a list of these industrial poisons, and recently the United States Department of Commerce and Labor has published the following tabulated list, which deals with the source, chemical and physical properties, and the industries in which the poisoning occurs, together with the toxic symptoms following exposure:

"Carbon monoxide is described as a colorless, tasteless gas, and when in a state of diffusion is odorless, burning with a blue flame in the air. Coal vapor has about 0.5 per cent. of carbon monoxide. Illuminating gas, 6 to 10 per cent. carbon monoxide and 33 to 40 per cent. of mine gas. Water gas, a mixture of 41 per cent. carbon monoxide, 50 per cent. hydrogen, 4 per cent. carbon monoxide, 2 and 5 per cent. nitrogen. Producer gas contains 34 per cent. carbon monoxide and 60 per cent. hydrogen gas.

"Branches of industry in which poisoning occurs: In industrial plants with defectively planned or ill-tended firing and heating arrangements; plants for the production of industrial gas; mining (mine gases); coal mines; blast furnaces (furnace gas); Cowper apparatus; gas purification; coke ovens; smelting furnaces; gas machines; lime and brick kilns; dolomite calcining kilns; iron and metal foundries (drying of the molds); soldering in tin shops; charcoal burning; resin distillation; ironing; heating with open coal brasiers or coke stoves (drying the plaster and walls of new buildings); drying chambers."

Another source of danger from this gas has arisen in recent years from the extensive use of benzine and gasoline explosive engines, which are installed in the motor car, motor boat, and aeroplane. Investigations following accidental death from the gas escaping from such engines revealed the fact that the men attending the engines in the cabins of launches often have toxic symptoms—headache, dizziness, etc. In this connection it is the opinion of Surgeon-General Stokes, of the United States Navy, that noxious gases generated by exploded powder in the turrets, from burning coal in the fire rooms, and other gases similar to carbon monoxide in illuminating gas, are responsible for the collapse and sometimes death of men working in the above spaces.

To quote further from the Bulletin, the symptoms of acute poisoning are: "Increased blood pressure at first, with slowing of the pulse and pounding heart beat; later, lowering of the pressure, with rapid but small pulse, and, not infrequently, with discrete spots of dilatation in the superficial bloodvessels. Remarkably pale red discoloration of the blood and of the dilated spots; formation of carbon-monoxide hemoglobin is demonstrable by the spectrum. (*a*) Disturbances of the general health. In mild cases, dull headache; flashes before the eyes; giddiness; ringing in the ears; nausea and fulness in the gastric region. (*b*) In severe cases: Bluish discolortation of the skin; spasmodic, wheezing respiration; sometimes tonic and clonic convulsions; more often paralytic symptoms, either with weakness of all the extremities, or the lower only, or indeed of only single groups of muscles, including also the facial muscles. The convulsive stage, which may be altogether absent, is succeeded by the stage of asphyxia, with sensory and motor disturbances, involuntary voiding of urine, semen, and feces; subnormal temperature; weak, slow, and intermittent pulse; loss of consciousness. As sequels there have been observed pneumonias, inflammations of the skin, paralyses and psychoses, the last two often pursuing an unfavorable course. Chronic poisoning (among ironers, firemen, cooks, etc.): Frequent headaches; dizziness; nausea; vomiting; coated tongue; weakness of memory; anemia without chlorosis; "hot flushes;" formication; palpitation of the heart; insomnia; general debility and feebleness of the psychic functions."

Ziehen describes the chronic monoxide poisoning which affects those employed in laundries as ironers, firemen, and others who work in crowded, overheated places in which there are bad heating arrangements, and in which these people are obliged to remain for some considerable time. It manifests itself in general nutritional disturbances, and presents a picture of mental and bodily fatigue which is sometimes regarded as either neurasthenia or hysteria.

The following is the clinical record of the case:

CASE No. 18,888.—M. A. O., aged forty-five years; native of Ireland; single; indigent; admitted December 10, 1910.

The following history was supplied by an aunt of the patient, with whom she made her home. After the patient's return to her normal mental state she corroborated this information.

Family History: Negative so far as could be learned as to nervous or mental diseases, epilepsy, etc.; mother died of tuberculosis at the age of thirty years.

Personal History: Born in Ireland; was elder of two children; always healthy; common-school education. After her mother's death kept house for her father until she came to this country, at the age of twenty-eight years. Upon her arrival in this country she obtained employment as a domestic, and was evidently an efficient servant, as she was employed for a number of years by prominent families in this city, including those of a United States Senator and a German Ambassador. She was of a cheerful disposition, habits good, and always attended to her religious duties. Was fond of reading history, fiction, periodicals, etc. On November 2, 1909, she went to bed in her usual good health, and the following morning was found in a deep coma. Upon investigation it was found that illuminating gas was escaping from a defective fixture in the room which she now occupied for the first time upon her return from her vacation, not knowing that the stop-cock was broken, though this fact was known by the other servants in the house. Had it not been for an open window the accident would probably have been fatal. She was at once removed to the George Washington University Hospital, where she remained in an unconscious condition for four days. The informant called on her four days after the occurrence, but at this time was unable to arouse her. However, on the sixth day the patient recognized her, although she was dull of comprehension and appeared somewhat somnolent. From this time on the patient daily improved, and was discharged November 13, 1910, having recovered from the acute effects of the poisoning.

Abstract of record from the George Washington University Hospital, where she was first taken immediately after the accident: Admitted to the George Washington University Hospital, November 3, 1910. For the first twenty-four hours patient's temperature fluctuated between 101° and 100°; pulse between 120 and 82; respirations 40 and 22. Was given oxygen on admission and normal salt solutions frequently, at least every four hours; hot applications externally. Patient began to perspire about three hours after admission. She was given oxygen every hour for a short time. Hypodermoclysis of 500 c.c. was given.

Summary: At the end of first day: Nurses' notes: Was catheterized. Patient perspired a great deal. Hot bottles; oxygen every hour, for fifteen minutes during the last eighteen hours. Patient turned on her side for a half hour during the night.

Summary: At end of second day: Maximum temperature 101°, minimum 98.6; pulse 100 to 80; respirations 30 to 24. Oxygen given every hour, for fifteen minutes. Hot applications; normal salt injections. Nurses' observations: Patient restless all night; seemed more rational.

Summary: At end of third day: Maximum temperature 100°, minimum 99°; pulse 100 to 70; respiration 30 to 24. Oxygen given. Saline solution discontinued. Patient conscious at intervals; slept very little; complained of pain in back; very restless all night; slept at intervals.

Summary: At end of fourth day: Temperature normal; pulse 78° to 70°; respiration 26 to 24. Patient restless all night, complaining of pain in back and neck; slept about one hour. Patient tossed about the bed; got out of bed.

Summary: At end of fifth day: Maximum temperature 98.6° to 97.8°; pulse 80 to 78; respiration 28 to 24. Patient very quiet during the day; restless all night; complained of pain in back; asked to get out of bed. Slept from one o'clock on at intervals.

Summary: At end of sixth day: Temperature normal; pulse 80 to 74; respiration 24. Patient very restless all night; complained of pain in the back; wanted to get out of bed. Slept about three hours.

Summary: At end of seventh day: Temperature normal; pulse 80 to 74; respiration 24 to 22. Patient very restless all night; slept about four hours during night. Very nervous. Given regular diet; eats well. Voided urine.

Summary: At end of eighth day: Temperature normal; pulse 78 to 76; respiration 24 to 22. Patient very restless; slept about four hours during the night. Very nervous; given regular diet; eats well. Voided urine. Patient sat up in chair during the day.

Summary: At end of ninth day: Temperature normal; pulse 80; respiration 24. Patient up during the day; walked about; slept well.

November 13, 1910. Tenth day: discharged.

Upon her return to her aunt's home she continued to improve, and after two weeks was allowed to go back to the place where she had been working, as relatives and friends at this time considered her well. Soon after she resumed her duties the servants with whom she was associated noticed that she was becoming dull and forgetful about her work. She gradually became worse, and on this account at the end of a week she was taken back to the home of her aunt, where she remained until her admission to this hospital.

While at her home, one week later, her aunt observed that her actions were peculiar; her movements were very awkward and her memory seemed to be a complete blank. She had outbursts of laughter without provocation; did a great many irrational acts; for instance one day she was noticed trying to put the trousers of a little boy on for a waist. She put her hands through the legs and tried to pull the trousers over her head. She was unable to find her way about the house. One day she wandered from her aunt's house to the United States Treasury Building, where she accosted a policeman and told him that she was in search of the house on U Street where she was formerly employed. She was directed to the residence and found her way there safely. A few hours afterward she was again taken back to her aunt's home. At this time she was oriented to person and place, but could not tell the hour, day, month, or year. Was unable to attend to her personal wants, became very untidy; would not remain in bed; and finally passed into a state of confusion and was brought to this hospital December 10, 1910, thirty-eight days after trauma.

On admission to this hospital, December 10, 1910, the patient was in a semistuporous condition; would answer questions promptly; was able to give her name, but all other replies were incorrect and irrational. She extended her tongue when told to do so, but otherwise was unable to carry out the simplest orders given her; was spoon-fed, as she was unable to feed herself. Throughout examination patient showed causeless laughter.

Physical Examination: Patient was in bed; well-nourished white woman; height five feet two and a half inches; weight 120 pounds; mask-like facial expression; hair dark brown mixed with gray, fine in texture; slight lateral scoliosis; deformity of sternum at articulation of the gladiolus with the manubrium; ears small; right antihelix more prominent than the left; complexion sallow; superfluous hair on face; skin free from eruptions; mucous membranes moist and pale; tongue coated, eroded on tip; gums inflamed; pyorrhea alveolaris marked; breath foul; appetite poor; bowels regular. Heart normal in outline; slight presystolic murmur over apex. Protruded tongue showed slight tremor; pupils equal, reacted promptly to light and accommodation; knee-jerks exaggerated, right greater than the left; plantars diminished; anesthesias over the whole surface of the body, including the face; she showed no reaction to deep pin-pricks, although to some extent this may have been due to the mental dulness. She could not recognize heat or cold when applied to the surface of the body, nor was she able to distinguish the gustatory tests used—salt, sour, sweet, or bitter; called a solution of quinine when placed on her tongue, sour; unable to recognize any of the olfactory tests; said peppermint was bitter, cloves didn't know; called stench hartshorn; astereognosis present; grip, right hand 14 kgs.; left hand, 9½ kgs.; coarse tremor of extended hands; gait unsteady and uncertain; balancing power impaired, involuntary evacuations of the bladder and bowels; urinalysis negative; no sugar, albumin, or casts.

Wassermann reaction with the blood serum and the cerebrospinal fluid negative. Cerebrospinal fluid clear; protein content not increased; Noguchi test negative. Cell count 1 per c.mm. Differential: lymphocytes, 98 per cent.; large mononuclears, 2 per cent.

The notes made for the next three days showed that mentally the patient was dull and apathetic; responded promptly to all questions, but was able to give little additional information in regard to personal matters; gave name of the country in which she was born, but could not give the name of the county or parish. Her replies were irrelevant and accompanied by outbursts of laughter. This tendency to laughter was also shown when she heard the voices of anyone around her or whenever anyone approached the bed. She had a mistaken identity of all persons in her environment, although she recognized her aunt on her visits. She appeared clearer so far as she was able to comprehend and carry out some simple orders given, although there was a retardation and some incoördination in all her movements. When asked where she was she said she was at home, but that she had just been down the river on a boat with President Taft and his daughter Helen. At this time she carrried out the following orders after considerable hesitation: right forefinger on left ear; right hand on left knee; left hand on right knee.

The neurologic symptoms above mentioned still continued; deep reflexes all exaggerated. At this time there was present on both sides a wrist clonus, also a slight Babinski; anesthesias were still present, but there was an area on the inner side of the right thigh, just above the knee, about the size of a silver dollar, which showed a delayed reaction to pin-pricks.

The following is an abstract of the clinical notes for the next ten days, December 15 to 25:

Consciousness still clouded. She gave prompt replies to all questions, but still showed a tendency to confabulate; on one occasion said she had just returned from the Bureau of Engraving and Printing; that she was employed there, and again that she had been at her home. As a rule all replies were incorrect. Said she was born in Ireland, but when asked the county said first County Limerick and then County Mayo, when in fact she was born in County Clare. Still had a mistaken identity of persons, and showed uncontrollable laughter. Whenever she heard anyone speaking near her she laughed heartily without cause. She continued to have incontinence of urine and feces. At this time she was able to comprehend and carry out simple orders as follows: Right forefinger on left ear; right heel on left knee; left heel on right knee; all movements were unsteady and ataxic. Romberg present; gait unsteady; marked Babinski. All deep reflexes were still exaggerated; there was marked clonus of both wrists and ankles on both sides. Anesthesias were not so marked; she was able to recognize deep pin-pricks on almost all parts of the body, but could not localize light pin-pricks.

During the next five days the patient showed some improvement. She had learned the names of two physicians, the head nurse, and two noisy patients in the ward, but was unable to identify them. She was disoriented to place and time. She was at this time able to give the names of one or two of her employers, the name of the church she attended in the city, the correct county and parish in Ireland in which she was born, and gave correctly the names of her relatives in this city and in Ireland. Falsification of memory continued: Said she was at the Y. M. C. A., and had just returned from the city.

The deep reflexes continued exaggerated; ankle clonus and wrist clonus present; also Babinski; anesthesias were not so prominent as formerly; patient responded to light pin-pricks on face, hands, and inner side of her legs and thighs.

During the next five days, December 30 to January 5, patient continued to improve, especially on the physical side. She appeared to be able to comprehend all instructions without much effort on her part so that she was able to coöperate. When told to put her right forefinger on her left ear she put her right forefinger on the right ear. When asked if that was correct she said, "No, you said my left ear." She then placed her left forefinger on her left ear. When asked to extend her right hand she extended her left hand. When told to extend her right and left foot she did so correctly. After five minutes these orders were again repeated, and this time she failed in all. She still showed some impairment of the sterognostic sense; she recognized a number of objects placed in her hands, but failed in several others. The physical examination at this time showed sordes of the teeth and tongue, mild gingivitis. Patient was hyperalgesic to pin-pricks of the face and ears, the nipples, sacral region, and soles of the feet. After much experimenting she recognized light touches of cotton wisps. Thermic sense appeared normal over the entire body; gustatory sense normal; olfactory: said camphor was smelling salt; stench, pleasant. Equality of grip, 10 kgs. each. Reflexes: triceps and radials and ulnars markedly exaggerated. Knee-kick exaggerated, with slight clonus; plantar and tendo Achillis present; no defense reaction from the feet; jaw-jerk present; abdominal absent; Babinski on both sides; slight Romberg present; gait ataxic; eyelids on closure and extended hands showed tremor; tongue deviated to the right side. Five days later this patient was up and dressed; was able to feed herself and had sphincter control; said she was living in the Capitol Building; that she had been living there five years; said she was not insane, but had a weakened mind from taking gas.

For the next ten days, up to January 20, patient improved both physically and mentally; showed orientation, but was unable to recall any of the occurrences in her life for the past two months; assisted with work about the wards. She could recall all the principal events of her own life up to the time of the accident, but showed an anterograde amnesia for subsequent occurrences.

From this time on the patient improved rapidly; regained insight and reacted normally to her environment. A mental examination at this time, about February 1, showed that she had recovered her mental faculties, but there was an anterograde amnesia covering a period of three months.

As she was in poor physical health she was retained in the hospital until April 7, when she was discharged as recovered. The physical examination on that date showed the following results: Patient recognizes pin-pricks and light touches all over the body; thermic and stereognostic senses normal; olfactory and gustatory senses normal; no Romberg present; pupils respond sluggishly to light and accommodation; sympathetic scarcely visible; right and left triceps very active and exaggerated; radial and ulnar present; right knee-kick exaggerated; tendo Achillis diminished; plantar reflexes very slight; no defense reaction. Patient did very well in giving the above tests. She was willing to coöperate; her actions were inhibited.

If one seeks analogous cases of psychic disturbances from carbon-monoxide poisoning in the literature very few will be found. What strikes the attention most forcibly when the cases are compared with each other is that almost every case has its own stamp and each one presents a clinical picture different from the others. Le Dosseur has collected a number of cases in which the following mental disturbances followed: aphasia; acute delirium; transitory chronic delirium; mental confusion; amnesia; melancholia; dementia. On the physical side he found muscular paralyses of diverse types; hemiplegias; paraplegias and monoplegias; various trophic disorders; convulsions, etc.

The mental condition of this patient on first observation was deep confusion. She answered questions readily as one in advanced stages of senility is apt to do. All answers were accompanied by silly laughter and none were correct. However, the examination of the patient during the first few days showed that dementia was only apparent, and that there was a lack of power of attention and concentration which prevented intelligent conversation and made her replies unreliable and incorrect and the product of her own imagination.

The principal manifestation of psychic disturbance in these cases is a loss of memory. The amnesia produced by oxide of carbon poisoning is generally sudden in its appearance and not slow and progressive like traumatic or alcoholic amnesia; it is a characteristic symptom appearing suddenly and extinguishing at once the entire past, and reducing to almost nothing the perception of the present surroundings. It may be the only apparent symptom in a mild case of poisoning and soon disappears, or it may be accompanied with disturbances of attention. The amnesia may simulate the Korsakoff syndrome in the polyneuritic psychosis with confabulation, pseudo-reminiscences, etc. A defective memory may exist in a certain number of cases which recover. This amnesia is retrograde or anterograde in type; it is variable in course and intensity; in some cases it is transitory, lasting often only a few hours or days; in others it persists for months or years; or it may be continuous, and again it may require the use of memory exercises to produce any results. In this patient it lasted nearly three months, blotting out this period from her life. More than one month elapsed from the time of the accident until the mental symptoms developed, or at least were recognized, and her admission to the hospital. We are unable to determine from information received how much her memory was impaired after the acute effect of the poisoning had run its course. If there was a defect present it was not apparent to her friends and relatives with whom she came into daily contact. When she began to regain consciousness in the hospital she had a complete retrograde amnesia. After several weeks she showed anterograde amnesia only, that is from the time of the accident and subsequent thereto. The patient was able to recall the details of her life the day before the accident, but she could not recall any of the events occurring from the time she fell asleep in her surroundings on the evening of November 2 until the middle of the month of February, when under treatment in this hospital. After her recovery the total periods of amnesia were three months.

Sachs, who has compiled a treatise concerning these complications, says: "In the early stage of convalescence a total amnesia is especially typical, either extending over the time before the poisoning, retrograde, or to the things of the present, anterograde. The falsifications of memory which were noted in this case during the first month show the Korsakoff syndrome. Stierlin reports this symptom in two of his patients. In the records of these cases one finds the various forms of amnesia diversely associated. Le Dosseur cites Brourdel's case of a physician, who following an incomplete intoxication, lost his memory totally. Arriving at his patient's house he forgot her name and the course of the illness in her case. The amnesia lasted eighteen months, at the end of which time he fully recovered. Le Dosseur mentions in his study a lithographer who was amnesic to such a point that he was obliged to consult an indicating board in order to recall the colors that should be applied to each part of the plate. M. Bricard reports a case of a decided retrograde amnesia. A woman, aged twenty-one years, attempted suicide. The amnesia was complete in all that related to the suicide. She knows it because she was told of it, but doubted very much. As to events immediately preceding the suicide there was found a retrograde amnesia for at least one week.

Many writers call attention in this intoxication to a marked aphasia, although sometimes it is mentioned as a simple trouble of speech in the form of an embarrassment or stuttering. This apparently is not a true aphasia, but may rather be designated an amnesic aphasia, since with the disappearance of the amnesia the aphasia becomes less marked or disappears altogether.

Sometimes in coming out of the coma there appears an acute transitory delirium which may last a few hours, accompanied by excitement in which the patient is euphoric to a degree. This delirium is rarely accompanied by hallucinations, but in chronic intoxications the delirium is more prolonged, and is accompanied by various hallucinatory disturbances, which may take the form of delusions of persecution. At this stage our patient did not show delirious experiences of any description.

Kraepelin observed that when those affected first awake from the sleep of the poisoning in many instances there is an interval free from any disturbances which lasts days or weeks, and then suddenly or gradually the severe symptoms of the disease manifest themselves, and some relapses are recorded. In this connection Weidner says: "It is not possible to separate the after phenomena from the acute symptoms in a sharp manner, for in most cases the source of the same extends back to the acute stages with the exception of a few phenomena of special brain affections which appear after a free interval, or become manifest after such interval; and secondly, the boundary between the disturbances which must be ascribed to the acute poisoning and those which are to be understood as after phenomena are so labile that up to the present there appears to be no unity of opinion concerning them."

The case under discussion showed such a reaction to the effects of the intoxication, for after the acute symptoms had subsided she was well enough to be about her usual duties for at least ten days or two weeks before the mental symptoms became evident. Abrahamson cites a similar case in which a patient of his was comatose for two days following an acute intoxication from illuminating gas, when her intelligence returned and she went home. Two weeks later she developed a psychosis.

A marked reduction in the emotional field has been observed by many writers. Recently Pfeifer has described singular phenomena which often attracts attention in poisoning from coal gas; that is, the fixed mask-like expression of the face. The emotional tone of this patient for nearly two months was one of indifference. There were abrupt outbrusts of an irresistible tendency to laughter. These outbreaks were spasmodic in character, and occurred without provocation. All her replies were accompanied by causeless laughter and it was evident whenever anyone approached her bed. This emotion had no depth, as she laughed when a patient in the adjoining bed was weeping. In the intervals between these attacks of laughter her face was apathetic. This appears to be a common symptom in carbon-monoxide poisoning, and has been referred to by several observers. Some of these cases show changeable humors, for they rapidly change from despondency to laughter. Stierlin mentions lack of emotion in his study. One of his patients evinced this symptom, showing a lack of proper feeling toward his sweetheart, to whom he was engaged before the accident, and expected to marry shortly. To some extent this may be explained from the characteristic autopsy results which have been reported in a series of cases where the symmetrical centres of softening were in or about the vicinity of the optic thalmus, most frequently in the globus pallidus and the lenticular nucleus, and hence in those sections of the brain which are supposed to control mimicry.

A subnormal temperature is characteristic of the first stages of the poisoning, after which it rises rapidly, attaining the maximum the first twelve hours. No record of a subnormal temperature in this case was made. The first recorded temperature, 101°, was the maximum on the first day following the trauma. On the four subsequent days it fluctuated between this and normal, and from then remained stationary. Ravine cites a case of a high temperature being reported in a child, aged eight years, which reached 110° in eight hours, accompanied by a pulse rate of 120 per minute. The pulse rate of this patient was in relative proportion to the temperature.

On the physical side we found involuntary evacuation of the bowels and bladder, exaggerated tendon reflexes, with clonus, including the Babinski reflex. We also had disturbances of sensation, including anesthesias, hyperalgesias, etc. The involuntary evacuation of the bowels and bladder existed for about one month in this hospital, and a few days prior to that. This was probably due in some degree to the mental confusion, and not wholly to the loss of spinal-cord control, for after the confusion disappeared she gradually recovered this control. It is difficult to state whether the neurologic disturbances were due to central or peripheral changes in the nervous system. However, the disturbances of sensation including anesthesias, etc., were to some extent due to the neuritis which always accompanies intoxications of this class.

Opinions differ in regard to the action of carbon monoxide on the human economy. Haldane has shown by experiments that all symptoms, immediate and secondary, can be referred to the want of oxygen, and that they vary according to the saturation of hemoglobin with the carbon-monoxide gas. He states that "With 20 per cent. saturation the only symptom is a slight tendency to dizziness and shortness of breath on exertion. As the saturation increases, however, the symptom of want of oxygen becomes more and more pronounced, until at 50 per cent. saturation it is scarcely possible to stand, and even slight exertion causes temporary loss of consciousness." In the fatal cases 80 per cent. of the hemoglobin is saturated with carbon monoxide. However, Le Dosseur sums up his conclusions as follows: "That in cases of survival, oxycarbon intoxication leaves frequently after it a series of complications bearing principally on the nervous system. The paralysis comes from cerebral and medullar lesions, or is due to the polyneuritis, or two other causes may come into play, traumatism and hysteria. The mental troubles are sometimes connected with material alterations in the brain, hemorrhages, thromboses, softenings. Sometimes they are completely independent. In all these cases the simple anoxhemia of the red corpuscles is insufficient for explaining all the manifestations. Hysteria itself, though possible in certain cases, is unable to explain the phenomena observed. That experiments would tend to prove that carbon monoxide is dissolved in the serum and has a direct specific localized effect on the nerve cell." Mott is of the opinion that all the nervous symptoms can be explained by the thrombotic occlusions and hemorrhages which occur as the result of carbon-monoxide poisoning. These hemorrhagic conditions are more noticeable in the white matter of the brain, but this can be explained by the anatomical construction of the bloodvessels supplying these parts.

Unfortunately all observations of the course of such carbon-monoxide psychoses over a period of years is entirely wanting. Sachs in the preparation of his treatise on this subject was impressed by this fact, and states, "It would be interesting to know the further course of such cases." It is only in a mild uncomplicated case of this sort that we can make any regular comparisons as to its termination, as so many factors are to be considered. The majority of these cases prove fatal, and where this is not the case the mental symptoms vary from dementia to complete recovery. There are many things to be considered in the course and prognosis of the disease—namely, the general make-up and predisposition of the patient, the degree of poisoning, and in mine accidents we have to consider, in addition to the intoxication, the emotional stress, the overexertion and deprivations from lack of food and the exposure accompanying the trauma. Stierlin in his work gives a full report of observations made by himself and others among twenty-one survivors in the mine catastrophe at Caurrieres, on March 10, 1906, which claimed 1100 victims. These observations are of importance from the fact that they were continued over a period of two and a half years in the natural environments of the patients where they showed their psychopathologic conditions in the eccentricities of their lives and in their personal relations toward their families and friends. None of these patients made a complete recovery, although some of them were able to earn a living. The chronic effects of the intoxication, however, remained, which was shown by the neurologic changes as well as in the various forms of dementia present. He classified the mental phenomena into four groups, as follows, although none of them could be considered an entity, as each class encroached upon the other: (1) Psychoses caused by carbon-monoxide intoxication; (2) psychoneuroses caused by carbon-monoxide intoxication; (3) emotion psychoses; (4) traumatic neuroses of mixed etiology.

Mott calls attention to the fact that, considering the effect of carbon-monoxide poisoning being followed by mania, melancholia, confusion, and other mental symptoms, it must not be lost sight of that many cases to begin with are suicidal, and therefore if not actually insane at the time probably possess an insane or neuropathic temperament. This case was a pure and simple intoxication uncomplicated by any other neurologic factor. There was no inherited predisposition, nor was there present any deviation from the normal in her mental state previous to the trauma. She gave no evidence of emotional instability, had an even temperament, and was intelligent for one of her class. I am satisfied from the history given by her aunt and one of the servants who had been her friend for a number of years that suicide did not enter into this case. She was in an unusually happy mood previous to the poisoning, and besides this she was a devout Christian and always faithful in the performance of her religious duties. While the active mental symptoms abated in March she was not discharged until one month later, as her physical health was rather poor. Two months afterward she sailed to her brother's home in Ireland, where she has remained ever since. Inquiries made from her aunt show that the patient has written regularly to her relatives in this country, and there is no evidence from the content of her letters that she has undergone any change since she left. However, if the patient returns to this country the writer will endeavor to keep her under observation for some time.

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ACUTE POLYMYOSITIS.

By Herbert Fox, M.D.,

DIRECTOR OF THE WILLIAM PEPPER LABORATORY OF CLINICAL MEDICINE, UNIVERSITY OF PENNSYLVANIA, PHILADELPHIA.

The following observations were made upon a microörganism obtained by blood culture in this laboratory, upon a case of acute polymyositis, in the service of Dr. Charles K. Mills, in the University Hospital. The case itself will be put on record later.

A. G.; acute polymyositis. Material at hand consisted of scrapings and exuded serum from a papular skin eruption. Save for Micrococcus epidermitis albus in the scrapings, these were sterile. Two days later a blood culture was taken (3 c.c. blood to 200 c.c. +1 per cent. glucose bouillon). Specimens were again taken from the then rapidly drying cutaneous eruption, with the same result as above. From the blood culture a coccus was obtained corresponding to the one described by Martinotti[1] in a kidney abscess and named by him Micrococcus polymyositis. The organism in the fifth generation was agglutinated quite promptly, by the patient's serum. This coccus is in many ways identical with Micrococcus pyogenes albus and aureus, and for purposes of comparison a recently isolated strain of the latter was run through with the "polymyositis" organism from this case. The technical work is appended, and from it we conclude that the organism in question does not deserve a separate species name, the proper course being to speak of it as Micrococcus pyogenes var. polymyositis.

Biologically the culture which we shall call No. 5308 in this report differs from the usual forms of Micrococcus pyogenes only as follows: Upon plates and slants both of agar and gelatin it grows as a grayish-blue colony, and only in older cultures may one see a faint grayish-yellow color. It is never dense white or bluish-white. Liquefaction of gelatin is not so rapid in 5308 as in the Micrococcus pyogenes. No constant difference, such as in

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[1] Zentralblatt f. Bakteriologie, etc., 1898, xxiii, 877.